OBSERVATIONS & RECOMMENDATIONS

After reviewing data collected from **JENNESS POND** the program coordinators recommend the following actions.

We would like to encourage the association to conduct more sampling events in the future. With a limited amount of data it is difficult to determine water quality trends. Since weather patterns and activity in the watershed can change throughout the summer it is a good idea to sample the lake several times over the course of the season.

FIGURE INTERPRETATION

- Figure 1: These graphs illustrate concentrations of chlorophyll-a in the water column. Algae are microscopic plants that are a natural part of lake ecosystems. Algae contain chlorophyll-a, a pigment necessary for photosynthesis. A measure of chlorophyll-a can indicate the abundance of algae in a lake. The historical data (the bottom graph) show a *stable* in-lake chlorophyll-a trend, and concentrations have remained below the NH mean reference line since 1995. Algal abundance in June was 100% *Dinobryon*, which is a golden brown algae. While algae are present in all lakes, an excess amount of any type is not welcomed. Concentrations can increase when there are external and internal sources of phosphorus, which is the nutrient algae depend upon for growth. It's important to continue the education process and keep residents aware of the sources of phosphorus and how it influences lake quality.

- Figure 2: Water clarity is measured by using a Secchi disk. Clarity, or transparency, can be influenced by such things as algae, sediments from erosion, and natural colors of the water. The graphs on this page show historical and current year data. The lower graph shows a *fairly stable* trend in lake transparency. There was a slight decrease in clarity compared to previous years, and spring rainfall and snowmelt could have increased watershed runoff into the lake. This likely would have increased the turbidity of the water thereby decreasing the clarity. The 2000 sampling season was considered to be wet and, therefore, average transparency readings are expected to be slightly lower than last year's readings. Higher amounts of rainfall usually cause more eroding of sediments into the lake and streams, thus decreasing clarity.

- Figure 3: These figures show the amounts of phosphorus in the epilimnion (the upper layer in the lake) and the hypolimnion (the lower layer); the inset graphs show current year data. Phosphorus is the limiting nutrient for plants and algae in New Hampshire waters. Too much phosphorus in a lake can lead to increases in plant growth over time. These graphs show an *improving* trend for the upper water layer, and a *stabilizing* trend for the lower water layer. The hypolimnetic phosphorus concentration was unusually low for the pond. Phosphorus concentrations were well below the median for NH lakes this season, and we would like to see this continue for Jenness Pond. One of the most important approaches to reducing phosphorus levels is educating the public. Humans introduce phosphorus to lakes by several means: fertilizing lawns, septic system failures, and detergents containing phosphates are just a few. Keeping the public aware of ways to reduce the input of phosphorus to lakes means less productivity in the lake. Contact the VLAP coordinator for tips on educating your lake residents or for ideas on testing your watershed for phosphorus inputs.

OTHER COMMENTS

- **Please note** in June, phosphorus levels were found to be less than 5 µg/L in Bapple Spring Brook and Thurber Brook (Table 8). The NHDES Laboratory Services adopted a new method of analyzing total phosphorus this year and the lowest value that can be recorded is 'less than 5 µg/L'. If this caused an increase in the average phosphorus for either of the stations we would like to remind the association that a reading of 5 µg/L is considered low for New Hampshire's waters.

- Conductivity in Bapple Spring Brook was the highest ever recorded this season (Table 6). Spring rain and snowmelt could have contributed to this high reading in June, however the increase could indicate other sources of pollutants. Septic system leachate, agricultural runoff, iron deposits, and road runoff can all influence conductivity. It would be useful to uncover the reasons for increased conductivity as we continue to monitor the lake. We recommend bracketing the stream by sampling at different sites along the stream in order to be able to pinpoint any problem areas if they exist. Also, monitors may wish to sample the stream for metals, which can raise the conductivity of the water. If monitors are interested in conducting extra sampling, please contact the VLAP Coordinator at 271-2658.

- Dissolved oxygen was high at all depths of the pond in June (Table 9). The pond was not stratified at the time of sampling, which means that mixing was taking place throughout the water column. This mixing allowed oxygen to continually be replenished at all depths of the pond, which is why the oxygen reading was high on the bottom

compared to the low reading last June. As the summer progresses the pond stratifies into the epilimnion (upper water layer) and the hypolimnion (lower water layer). As stratified lakes age, oxygen is depleted in the lower layer by the process of decomposition.

- Total phosphorus was high in Hood Brook in June (Table 8). It was noted that the water level was very low and that the brook was stagnant in some areas. The turbidity of the sample was high (Table 11) indicating that the low flow conditions led to a large amount of organic debris contaminating the sample. The organic debris has phosphorus bound to it, which raises the phosphorus concentration of the sample and yields inaccurate results. Please be careful to only sample streams with sufficient flow to obtain a clean sample.

NOTES

- Monitor's Note (6/15/00): Hood Brook very shallow, stagnant in some areas.

USEFUL RESOURCES

Handle With Care: Your Guide to Preventing Water Pollution. Terrene Institute, 1991. (800) 726-5253, or www.terrene.org.

Clean Water in Your Watershed. Terrene Institute, 1993. (800) 726-5253, or www.terrene.org

A Brief History of Lakes, NH Lakes Association pamphlet, (603) 226-0299 or www.nhlakes.org

Answers to Common Lake Questions, NHDES-WSPCD-92-12, NHDES Booklet, (603) 271-3503.

Vegetated Phosphorus Buffer Strips, NH Lakes Association pamphlet, (603) 226-0299 or www.nhlakes.org

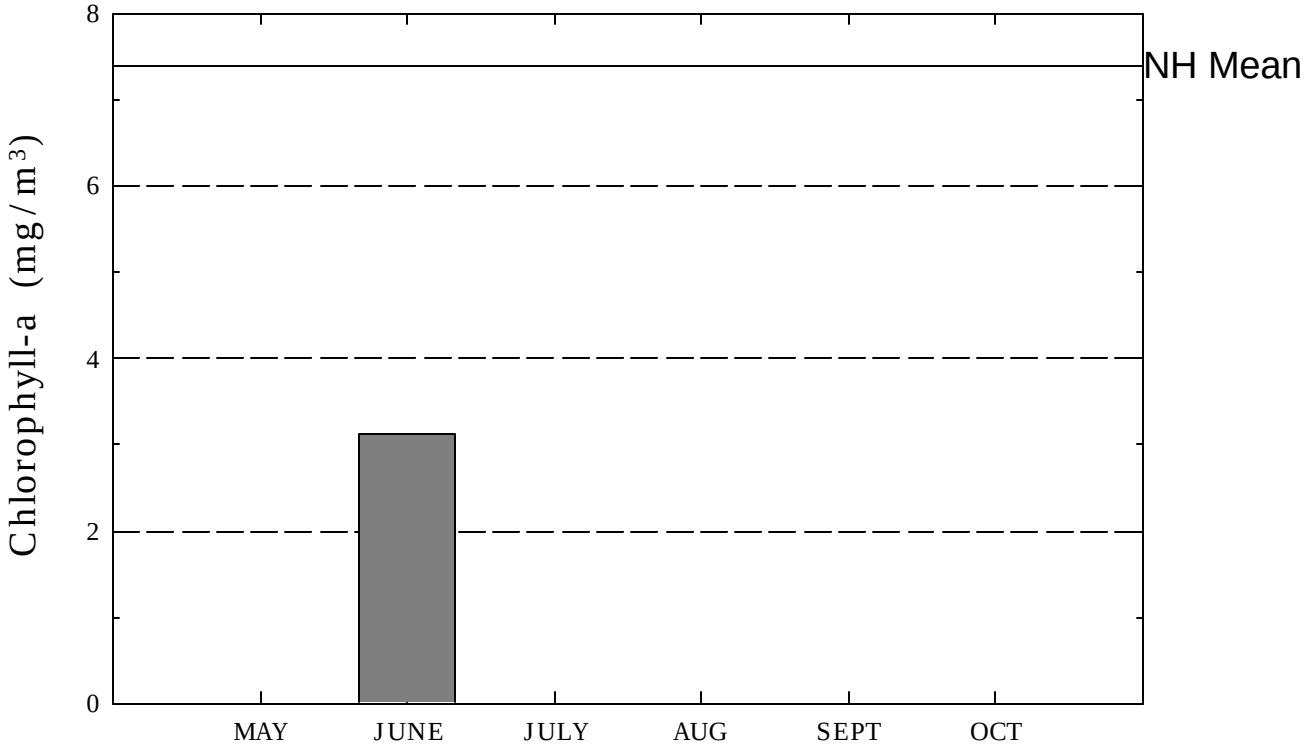
The Watershed Guide to Cleaner Rivers, Lakes, and Streams, Connecticut River Joint Commissions, 1995. (603) 826-4800

Aquatic Plants and Their Role in Lake Ecology, WD-BB-44, NHDES Fact Sheet, (603) 271-3503 or www.state.nh.us

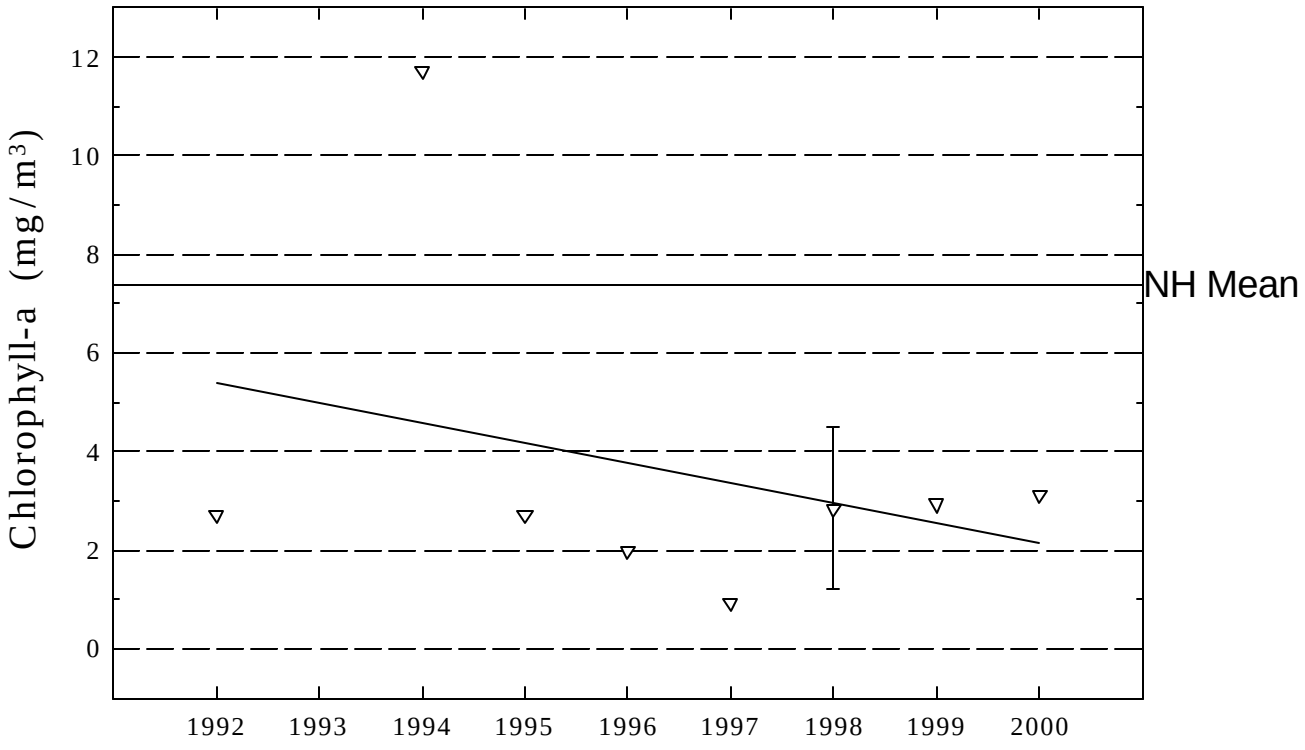
Weed Watchers: An Association to Halt the Spread of Exotic Aquatic Plants, WD-BB-4, NHDES Fact Sheet, (603) 271-3503 or www.state.nh.us

Jenness Pond

Figure 1. Monthly and Historical Chlorophyll-a Results



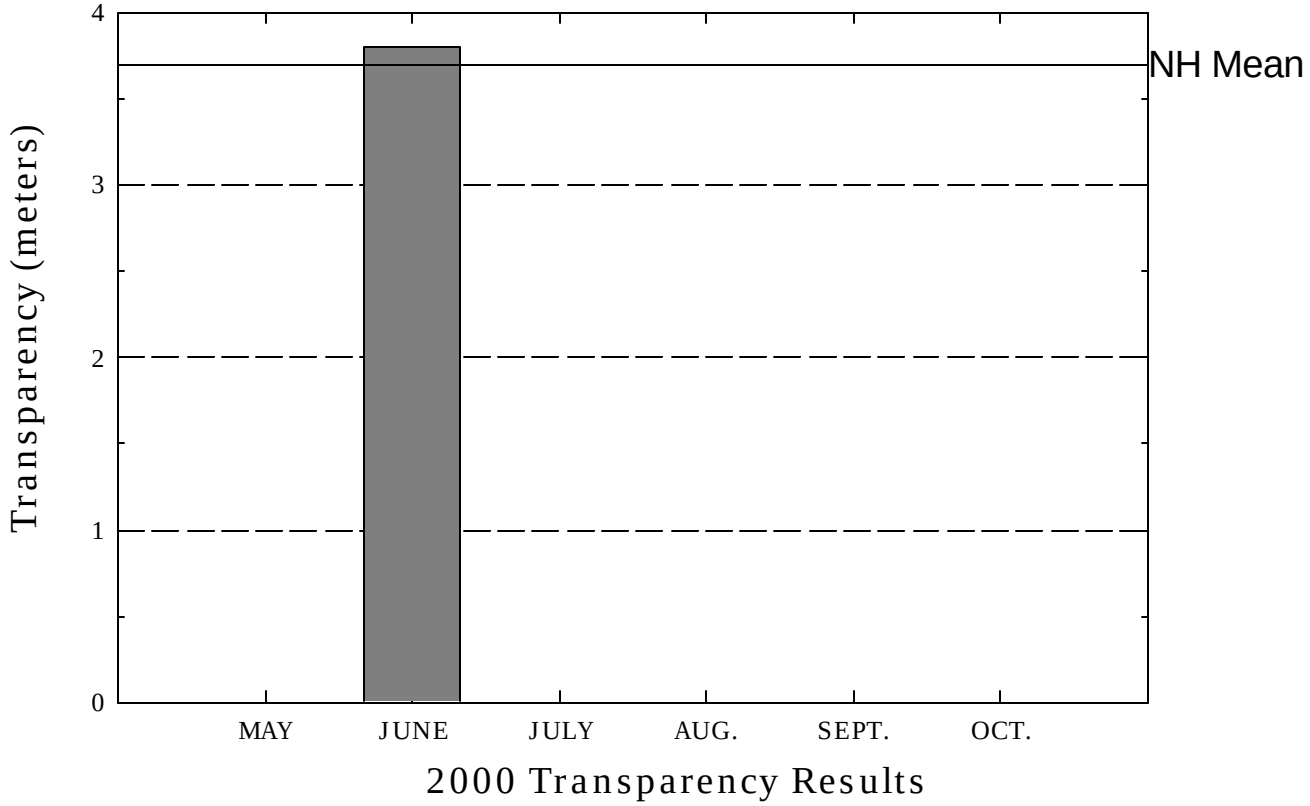
2000 Chlorophyll-a Results

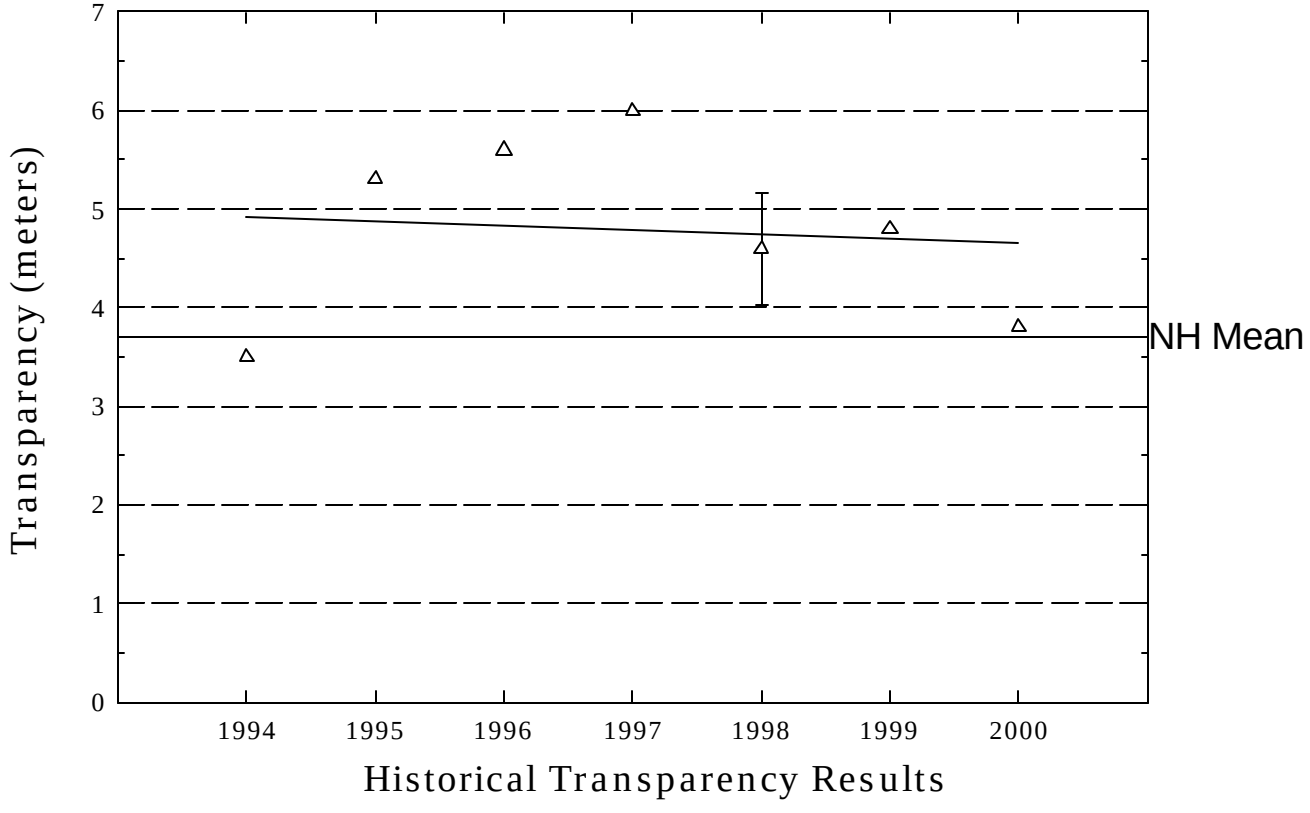


Historical Chlorophyll-a Results

Jenness Pond

Figure 2. Monthly and Historical Transparency Results





Jenness Pond

Figure 3. Monthly and Historical Total Phosphorus Data.

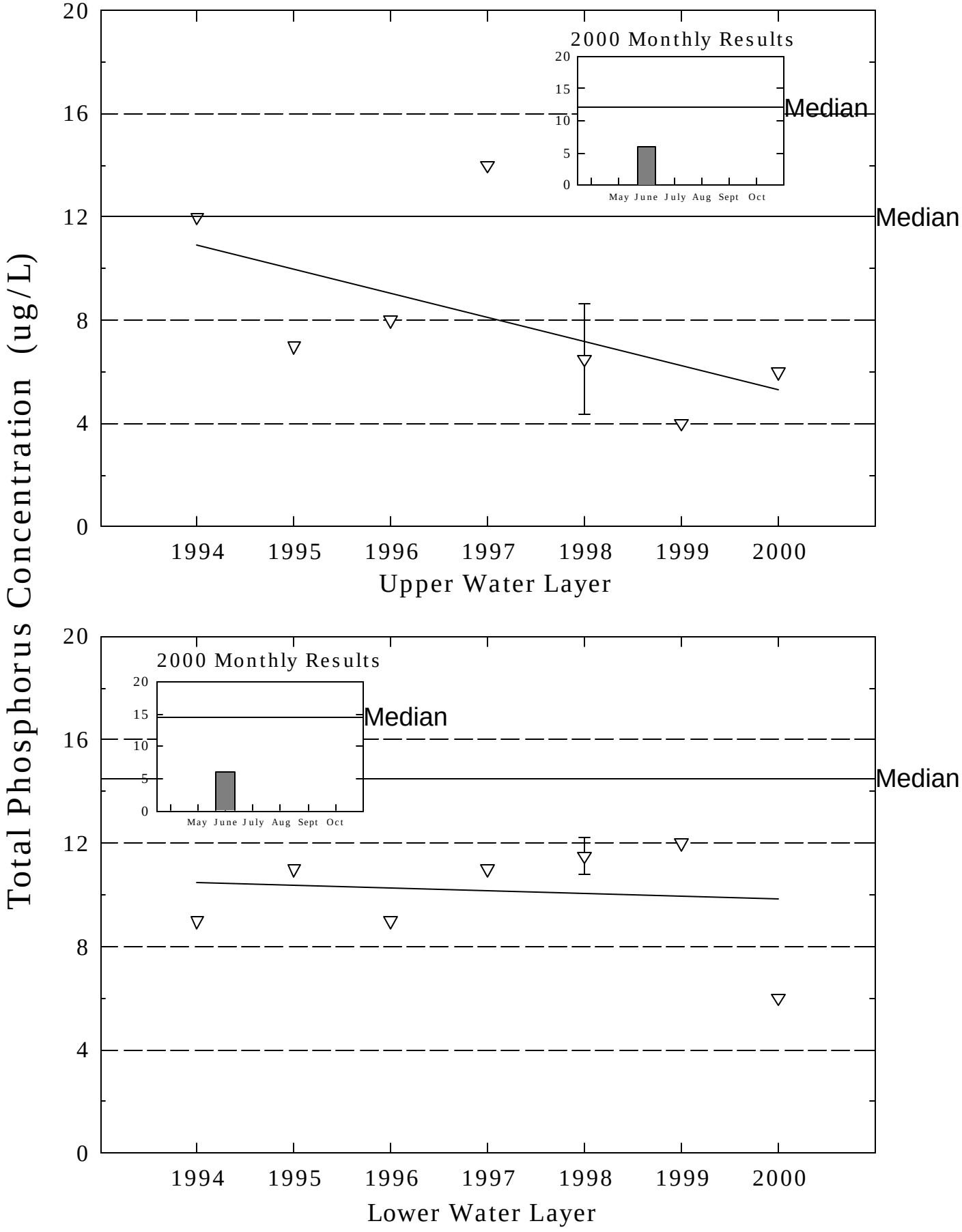


Table 1.

JENNESS POND

NORTHWOOD

Chlorophyll-a results (mg/m^3) for current year and historical sampling periods.

Year	Minimum	Maximum	Mean
1992	2.73	2.73	2.73
1994	11.73	11.73	11.73
1995	2.72	2.72	2.72
1996	1.99	1.99	1.99
1997	0.92	0.92	0.92
1998	1.68	4.01	2.84
1999	2.94	2.94	2.94
2000	3.13	3.13	3.13

Table 2.

JENNESS POND

NORTHWOOD

Phytoplankton species and relative percent abundance.

Summary for current and historical sampling seasons.

Date of Sample	Species Observed	Relative % Abundance
08 / 29 / 1994	DINOBRYON	41
	STAURASTRUM	23
	CHRYSOSPHAERELLA	11
08 / 02 / 1995	DINOBRYON	53
	STAURASTRUM	22
	CHRYSOSPHAERELLA	7
07 / 02 / 1996	MALLOMONAS	31
	DINOBRYON	23
	CERATIUM	15
07 / 24 / 1998	TABELLARIA	66
	CERATIUM	22
	SYNURA	5
06 / 29 / 1999	DINOBRYON	68
	TABELLARIA	13
	CHRYSOSPHAERELLA	6
06 / 15 / 2000	DINOBRYON	100

Table 3.

JENNESS POND

NORTHWOOD

Summary of current and historical Secchi Disk transparency results (in meters).

Year	Minimum	Maximum	Mean
1994	3.5	3.5	3.5
1995	5.3	5.3	5.3
1996	5.6	5.6	5.6
1997	6.0	6.0	6.0
1998	4.2	5.0	4.6
1999	4.8	4.8	4.8
2000	3.8	3.8	3.8

Table 4.

JENNESS POND

NORTHWOOD

pH summary for current and historical sampling seasons.
Values in units, listed by station and year.

Station	Year	Minimum	Maximum	Mean
#1 BAPPLE SPRING BK				
	1996	5.20	5.20	5.20
	1997	5.65	5.65	5.65
	1998	5.38	6.13	5.61
	2000	5.40	5.40	5.40
#2 MORSE SPRING BK				
	1997	6.33	6.33	6.33
	1998	6.04	6.36	6.17
	2000	6.07	6.07	6.07
#3 THURBER BK				
	1997	5.34	5.34	5.34
	1998	5.25	5.46	5.34
	2000	5.31	5.31	5.31
#4 HOOD BK				
	1997	6.06	6.06	6.06
#4 HOOD BROOK				
	1998	6.28	6.28	6.28
	2000	6.32	6.32	6.32
#5 COLETTI BROOK				
	2000	5.80	5.80	5.80
EPILIMNION				
	1994	6.43	6.43	6.43

Table 4.

JENNESS POND

NORTHWOOD

pH summary for current and historical sampling seasons.
Values in units, listed by station and year.

Station	Year	Minimum	Maximum	Mean
	1995	6.39	6.39	6.39
	1996	5.88	5.88	5.88
	1997	6.18	6.18	6.18
	1998	6.40	6.47	6.43
	1999	6.62	6.62	6.62
	2000	6.15	6.15	6.15
HYPOLIMNION				
	1994	5.97	5.97	5.97
	1995	6.02	6.02	6.02
	1996	5.69	5.69	5.69
	1997	5.65	5.65	5.65
	1998	5.87	6.28	6.03
	1999	6.19	6.19	6.19
	2000	6.04	6.04	6.04
OUTLET				
	1994	5.93	5.93	5.93
	1995	5.89	5.89	5.89
	1996	5.42	5.42	5.42
	1997	5.85	5.85	5.85
	1998	6.05	6.34	6.17
	1999	5.86	5.86	5.86
	2000	6.08	6.08	6.08
STATION 1				
	1992	6.43	6.43	6.43

Table 4.

JENNESS POND

NORTHWOOD

pH summary for current and historical sampling seasons.
Values in units, listed by station and year.

Station	Year	Minimum	Maximum	Mean
STATION 2				
	1992	6.50	6.50	6.50
STATION 3				
	1992	6.54	6.54	6.54
STATION 4				
	1992	6.33	6.33	6.33
STATION 5				
	1992	6.48	6.48	6.48
STATION 6				
	1992	6.66	6.66	6.66

Table 5.

JENNESS POND

NORTHWOOD

Summary of current and historical Acid Neutralizing Capacity.
Values expressed in mg/L as CaCO .

Epilimnetic Values

Year	Minimum	Maximum	Mean
1994	2.50	2.50	2.50
1995	2.50	2.50	2.50
1996	2.20	2.20	2.20
1997	1.70	1.70	1.70
1998	1.80	2.00	1.90
1999	1.70	1.70	1.70
2000	1.40	1.40	1.40

Table 6.

JENNESS POND
NORTHWOOD

Specific conductance results from current and historic sampling seasons. Results in uMhos/cm.

Station	Year	Minimum	Maximum	Mean
#1 BAPPLE SPRING BK				
	1996	207.0	207.0	207.0
	1997	209.0	209.0	209.0
	1998	104.5	192.3	148.4
	2000	224.0	224.0	224.0
#2 MORSE SPRING BK				
	1997	83.7	83.7	83.7
	1998	74.5	92.0	83.3
	2000	91.9	91.9	91.9
#3 THURBER BK				
	1997	39.4	39.4	39.4
	1998	32.9	37.0	35.0
	2000	40.9	40.9	40.9
#4 HOOD BK				
	1997	63.1	63.1	63.1
#4 HOOD BROOK				
	1998	40.7	40.7	40.7
	2000	44.0	44.0	44.0
#5 COLETTI BROOK				
	2000	21.1	21.1	21.1
EPILIMNION				
	1994	78.1	78.1	78.1
	1995	79.7	79.7	79.7
	1996	71.3	71.3	71.3
	1997	62.9	62.9	62.9

Table 6.

JENNESS POND
NORTHWOOD

Specific conductance results from current and historic sampling seasons. Results in uMhos/cm.

Station	Year	Minimum	Maximum	Mean
	1998	60.5	65.8	63.1
	1999	71.6	71.6	71.6
	2000	70.6	70.6	70.6
HYPOLIMNION				
	1994	77.7	77.7	77.7
	1995	78.8	78.8	78.8
	1996	71.0	71.0	71.0
	1997	61.9	61.9	61.9
	1998	58.2	65.0	61.6
	1999	72.3	72.3	72.3
	2000	70.5	70.5	70.5
OUTLET				
	1994	79.1	79.1	79.1
	1995	81.0	81.0	81.0
	1996	72.0	72.0	72.0
	1997	61.6	61.6	61.6
	1998	60.7	65.2	62.9
	1999	71.1	71.1	71.1
	2000	70.4	70.4	70.4
STATION 1				
	1992	68.8	68.8	68.8
STATION 2				
	1992	68.5	68.5	68.5
STATION 3				
	1992	69.4	69.4	69.4

Table 6.

JENNESS POND
NORTHWOOD

Specific conductance results from current and historic sampling seasons. Results in uMhos/cm.

Station	Year	Minimum	Maximum	Mean
STATION 4				
	1992	69.4	69.4	69.4
STATION 5				
	1992	69.5	69.5	69.5
STATION 6				
	1992	71.2	71.2	71.2

Table 8.

JENNESS POND

NORTHWOOD

Summary historical and current sampling season Total Phosphorus data. Results in ug/L.

Station	Year	Minimum	Maximum	Mean
#1 BAPPLE SPRING BK				
	1996	3	3	3
	1997	3	3	3
	1998	5	23	14
	2000	< 5	5	5
#2 MORSE SPRING BK				
	1997	14	14	14
	1998	10	14	12
	2000	8	8	8
#3 THURBER BK				
	1997	7	7	7
	1998	4	5	4
	2000	< 5	5	5
#4 HOOD BK				
	1997	43	43	43
#4 HOOD BROOK				
	1998	43	43	43
	2000	105	105	105
#5 COLETTI BROOK				
	2000	14	14	14
EPILIMNION				
	1994	12	12	12
	1995	7	7	7
	1996	8	8	8
	1997	14	14	14
	1998	5	8	6

Table 8.

JENNESS POND

NORTHWOOD

Summary historical and current sampling season Total Phosphorus data. Results in ug/L.

Station	Year	Minimum	Maximum	Mean
	1999	4	4	4
	2000	6	6	6
HYPOLIMNION				
	1994	9	9	9
	1995	11	11	11
	1996	9	9	9
	1997	11	11	11
	1998	11	12	11
	1999	12	12	12
	2000	6	6	6
OUTLET				
	1994	14	14	14
	1995	7	7	7
	1996	10	10	10
	1997	10	10	10
	1998	5	7	6
	1999	10	10	10
	2000	7	7	7
STATION 1				
	1992	6	6	6
STATION 2				
	1992	5	5	5
STATION 3				
	1992	5	5	5

Table 8.

JENNESS POND

NORTHWOOD

Summary historical and current sampling season Total Phosphorus data. Results in ug/L.

Station	Year	Minimum	Maximum	Mean
STATION 4				
	1992	5	5	5
STATION 5				
	1992	6	6	6
STATION 6				
	1992	7	7	7

Table 9.

JENNESS POND

NORTHWOOD

Current year dissolved oxygen and temperature data.

Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
		June 15, 2000	
0.1	18.0	8.3	88.0
1.0	18.0	8.3	87.2
2.0	18.0	8.3	87.3
3.0	18.0	8.3	87.5
4.0	18.0	8.3	87.2
5.0	18.0	8.2	87.0
6.0	18.0	8.4	89.0
7.0	17.0	7.8	80.3

Table 10.

JENNESS POND

NORTHWOOD

Historic Hypolimnetic dissolved oxygen and temperature data.

Date	Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
August 29, 1994	8.5	14.2	0.1	1.0
August 2, 1995	8.0	14.1	0.2	2.0
July 2, 1996	7.0	20.3	6.7	72.0
July 24, 1998	8.0	15.9	0.2	2.0
June 29, 1999	6.5	22.4	0.6	7.3
June 15, 2000	7.0	17.0	7.8	80.3

Table 11.

JENNESS POND
NORTHWOOD

Summary of current year and historic turbidity sampling.
Results in NTU's.

Station	Year	Minimum	Maximum	Mean
#1 BAPPLE SPRING BK				
	1997	0.0	0.0	0.0
	1998	0.2	2.1	1.1
	2000	0.1	0.1	0.1
#2 MORSE SPRING BK				
	1997	1.2	1.2	1.2
	1998	0.3	0.7	0.5
	2000	0.8	0.8	0.8
#3 THURBER BK				
	1997	0.1	0.1	0.1
	1998	0.1	0.1	0.1
	2000	0.0	0.0	0.0
#4 HOOD BK				
	1997	11.7	11.7	11.7
#4 HOOD BROOK				
	1998	3.7	3.7	3.7
	2000	13.5	13.5	13.5
#5 COLETTI BROOK				
	2000	0.9	0.9	0.9
EPILIMNION				
	1997	0.6	0.6	0.6
	1998	0.5	0.6	0.5
	1999	0.3	0.3	0.3
	2000	0.4	0.4	0.4
HYPOLIMNION				
	1997	0.3	0.3	0.3

Table 11.

JENNESS POND

NORTHWOOD

Summary of current year and historic turbidity sampling.
Results in NTU's.

Station	Year	Minimum	Maximum	Mean
	1998	0.6	0.9	0.7
	1999	0.4	0.4	0.4
	2000	0.3	0.3	0.3
OUTLET				
	1997	0.5	0.5	0.5
	1998	0.4	0.5	0.4
	1999	0.4	0.4	0.4
	2000	0.5	0.5	0.5